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SOARING TO SUCCESS

The Path to Developing High-Reliability Clinical Teams

Gary L. Sculli, MSN, ATP
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Putting knowledge to work

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Gary L. Sculli, MSN, ATP, Author
Keith E. Essen, RN, PhD, MSS, Author
Jay Kumar, Associate Product Manager
Adrienne Trivers, Product Manager
Matt Sharpe, Senior Manager, Creative Layout

HCPro
100 Winners Circle, Suite 300
Brentwood, TN 37027
Telephone: 800-650-6787 or 781-639-1872
Fax: 800-639-8511
Email: *customerservice@hcpro.com*

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Contents

About the Authors

Gary L. Sculli, MSN, ATP

Gary L. Sculli is a registered nurse with a master's degree in nursing administration and has worked in multiple clinical specialties including leadership and management. He has served as an officer in the United States Air Force Nurse Corps. Sculli is a former airline pilot for Northwest Airlines and served as both a captain and first officer on large transport category turbine-powered aircraft. He holds an FAA Airline Transport Pilot Certificate with three type ratings. Sculli has developed and taught crew resource management (CRM) programs in both aviation and healthcare.

He has worked for the Veterans Health Administration (VHA) National Center for Patient Safety since 2008, with subject matter expertise in the areas of root cause analysis, safety culture, just culture implementation, crew resource management, patient safety programmatic assessment, high reliability organization (HRO) theory, and HRO model implementation.

Keith E. Essen, RN, PhD, MSS

Keith Essen is a retired U.S. Army Colonel, nurse executive, and patient safety expert. He served as a perioperative course director for the United States Army and perioperative nurse consultant to the Army Surgeon General. He was the perioperative nurse director at multiple Army medical centers including Tripler Army Medical Center, Hawaii; Landstuhl Regional Medical Center, Germany; and Walter Reed Army Medical Center, Washington, D.C.

Essen was instrumental in establishing the patient safety program at the Landstuhl Regional Medical Center, a joint military facility in Germany. He was assigned as the Deputy Director (Army) for the Military Health System Office of Transformation. Subsequent to retiring from the Army, Essen worked for the VHA National Center for Patient Safety at the Veterans Administration (VA) Central Office in Washington, D.C., collaborating with the Department of Defense and the Centers for Medicare & Medicaid Services on patient safety programs. Prior to retirement from the VA, he served as a nurse executive with the VHA National Center for Patient Safety in Ann Arbor, Michigan.

Essen received a master's degree in strategic studies from the U.S. Army War College (Carlisle Barracks, Pennsylvania) and a PhD from the Uniformed Services University of the Health Sciences in Bethesda, Maryland. Essen and Sculli collaborated as instructors multiple times for the VA for CRM and Just Culture programs.

Foreword

While it's difficult for me to fathom, it was just a few years ago that I first heard the term *crew resource management* (CRM). Even after I was introduced to CRM principles, while I agreed with them philosophically, I was neither knowledgeable nor versed about the impact of their use in healthcare. Unfortunately, it wasn't long before I experienced firsthand just how important the application of these principles in healthcare could be.

I was introduced to CRM concepts and principles by author and colleague Gary Sculli. While I was impressed with his career path that spanned the airline industry, higher education, and healthcare practice, what struck me was his passion for exporting CRM from the airline industry into the day-to-day work environment at the front line of patient care (as he would say, where the risky stuff happens). As I became more immersed in the concepts, Gary approached me about engaging further to teach others about CRM. I was flattered, but could I be a credible facilitator on the subject? Could I elucidate the important concepts to motivate others in healthcare leadership, practice, and the front line of patient care? I was assured that my natural passion for the topic would prevail, so I pressed forward.

Around this same time, my mother underwent a routine cardiac procedure to eliminate her irregular heart rhythm. During the procedure, the cardiologist, as is the normal procedure, attempted to assertively thread the catheter through the heart, but the catheter punctured through the heart wall instead. What should have been a 45-minute routine procedure became a serious, life-threatening emergency. While the cardiologist may not have realized he was using CRM principles, the aims of CRM provided a foundation for him to act promptly and appropriately to save my mother's life. **CRM focuses on teamwork, threat and error management, and blame-free discussion of human mistakes.** The cardiologist quickly recognized the issue and immediately paused to assess resources; he called in the in-house cardiothoracic surgeon and an additional operating room team. He ensured my mother was stabilized while readying her for open heart surgery. When she was safely in the care of the surgeon, he updated us on what had transpired, apologizing for the error and promising to keep us apprised. I am happy to report that after an extended stay in the intensive care unit, my mother recovered well from the ordeal. But I'm even happier to relay that I was invited to listen in to the morbidity and mortality conference surrounding my mother's case. I witnessed the cardiologist recount the happenings without shame or fear of reprisal for the failures that contributed to the event. Further, I watched the medical and surgical staff and hospital leadership explore ways to prevent this event from happening again. Regardless of whether I wanted it, I now had a very personal experience, an intimate connection to the importance of CRM concepts in preventing patient harm. This experience only strengthened my passion for the topic.

As a part of the Veterans Health Administration National Center for Patient Safety, I have now been engaged in teaching a variety of multidisciplinary clinical teams the critical safety behaviors that comprise the discipline of CRM. The reward has been profound. To be an integral part of a necessary and overdue culture change toward high reliability in healthcare is, in one sense, the most important work of my career. I have become an ambassador for healthcare CRM and strive to model the strategies and concepts in my own practice as a nurse practitioner caring for liver transplant patients. Evidence demonstrates that you or someone you know has, or will be affected by, medical error. Evidence also shows that many errors can be traced to causal factors in the domain of communication, decision-making, and other human factor issues. If you work in healthcare, you know that there is much emphasis on technical skills, and while technical training ensures skill proficiency, it

doesn't address the potential for errors resulting from the lack of communication, teamwork, and leadership that are required in dynamic, increasingly complex healthcare environments. The authors of this book skillfully evidence the need for healthcare application of CRM principles and provide concrete examples of the principles in action. The anecdotes from the cockpit are both captivating and informative. The sidebars provided in each chapter are well researched and supplement the narrative nicely. It is my hope that you absorb the material so expertly described by Sculli and Essen, and act on the knowledge to improve your work in patient safety. It is our responsibility to garner these additional skills and employ them immediately: Patient lives are at stake.

Kimberly F. Moore, DNP, CRNP, LNC
Nurse Executive
VHA National Center for Patient Safety (17PS)
Nurse Practitioner
Cincinnati VA Medical Center
Department of Hepatology

Preface

This book has been written before—about a decade ago. Its title—*Soaring to Success*—was from a manuscript written initially for application to the nursing domain. While that effort was necessary, I always felt that the intended audience was not large enough in scope.

At that time, *high reliability* was a term that was just starting to be bandied about in healthcare. Today, if a healthcare organization is not stating boldly to all that it aspires to become a high-reliability organization (HRO), then it is behind the power curve. The term *high reliability* is everywhere, and it will be so for the foreseeable future. The book outlined how the airline industry's use of crew resource management (CRM) could be applied to nursing practice; but frankly, it applies to all disciplines in healthcare. This updated edition will approach the concepts from that point of view. It will apply to all facets of healthcare, to all clinicians and nonclinicians who work each day at the front line as part of a team with hands touching patients.

The true impetus for this project, however, came from my work with the Veterans Health Administration as it took deliberate and principled steps toward becoming an HRO. In the formative stages, there was much talk

about HRO models and HRO definitions. As strategies were discussed, I realized that whatever the approach, it is basically twofold. Implementations are either aimed at the culture of the organization as a whole or aimed at the front line, at the work-unit or microsystem level. Organizations can expend many resources on Just Culture efforts and other programs to facilitate staff trust in leadership or improve reporting, and these are necessary. However, they will not be fruitful without an unrelenting commitment to CRM-based team training for *all* frontline staff. Physicians cannot be exempt, the training must be considered paid duty time, participants must be free of any patient care activities during training, they must attend in the work units or teams in which they function day to day, and the training must be perpetual in nature. There can be no exception to this part of the formula.

Yet, this will be the heaviest lift and at times is the most formidable challenge of any HRO initiative. Frontline staff are tired of empty promises, changing leadership, poor staffing, and newfangled initiatives. They will be dubious and hard to win over. Healthcare as a culture is hierarchical; therefore, it will require a hard-nosed leader with thick skin to mandate multidisciplinary training. Tough decisions will need to be made. It reminds me of a conversation I had with the esteemed Dr. Michael Leonard. I was asking him his thoughts on what to say to healthcare chief executive officers who hold on to recalcitrant and disruptive providers for fear that without them, they will lose the ability to provide a particular service. His response was categorical and swift. He simply said, "I would tell them that they can't afford NOT to do without that provider." Simple but profound. The culture must be repaired and nurtured first—or nothing will succeed.

The operational environment is where the work gets done; it's where the risky stuff happens. Therefore, to achieve the HRO goal of reducing and/or eliminating harm, front-line teams must be taught—and expected to eat, sleep, and breathe—CRM behaviors. CRM builds teams that communicate effectively in all work regimes, appropriately manage errors and crisis when required to mitigate harm, deliberately work to develop accurate situational awareness, adhere to standard operating procedures in normal and emergency situations, openly discuss threats and tactics to remain vigilant, and possess the discipline to conduct briefings and use checklists without exception. This no doubt describes a high-functioning team, and when expressed this way, you can say this

describes a high-reliability team. Team training has been around for a while in healthcare, but gains have been fleeting because the training itself is not sustained. Healthcare CRM must be mandated for all and done so on a perpetual basis. Healthcare CRM departments must be established and staffed. Behavioral expectations must be taught, practiced via the use of simulation, and then evaluated yearly. There is no serious model for high reliability without this prescription.

After the furloughs resulting from the 9/11 terrorist attacks, I was forced out of the cockpit at a major U.S. airline and reentered nursing. Some of this book outlines my experience transitioning from the airline industry back into healthcare. The driver to write—and revamp—this material was the "culture shock" I experienced while making that transition. That experience is as relevant now as it was then. The airline culture is not perfect, but it is a high-reliability industry (HRI) with safety as a nucleus. It is understood that clinicians are not pilots and patients aren't airplanes; the differences between the unpredictable world of patient care and the often-controlled and knowable responses of aircraft must be taken into account. And while we may never reach or even find a way to define harm in terms of the high-reliability threshold of one catastrophic event per million, we can certainly emulate the practices of proven HRIs and tailor them for a unique application in healthcare.

Additional note: Several chapters were supplemented by the book's coauthor, Dr. Keith Essen. Dr. Essen and Dr. David Sine are responsible for the construction of the many sidebars, which add well-researched and academic augmentations to the main body of text.

Gary Sculli

CHAPTER 1

Healthcare and Aviation: A Culture Comparison

The purpose of this chapter is to provide an overview of two professional cultures: healthcare and aviation. It is important to remember that this overview is general in nature and largely based on my experience and perspective as I moved from the cockpit to the clinical environment. More detailed discussions of the concepts mentioned here occur in later chapters and will be referenced accordingly.

The airline culture is not perfect. Nothing involving human endeavor ever will be. It is, however, what I consider a true culture of safety. When I left the cockpit in 2002 and returned to nursing, I quickly reacclimated to the language and flow of the profession. But this time something was clearly different, and I knew it right away. My cultural paradigm had completely changed. My expectations for clinical care regarding levels of standardization, training, task load management, and communication styles were not the same as before. As I compared my experiences in the cockpit and my indoctrination into the airline culture to what I was currently encountering, I soon realized that I was in a state of culture shock, plain and simple. Reality was not at all matching my expectations.

I have always known that physicians and nurses are dedicated professionals who strive for excellence, yet now I was perplexed, even alarmed, at the number of clinical professionals (including leadership)—who accepted vast shortcomings in the culture with regard to risk and patient safety. My culture shock was their business as usual.

Sidebar 1.1

Characteristics of professions

Pilots and nurses share the basic characteristics of all professions. Namely, the expertise of the professional member has been validated by the community of their peers, the necessary knowledge and competence to be a member rests on scientific grounds, and the profession's members are oriented by a shared set of normative values (Starr, 1982). The method of gaining entry to the ranks of pilots and nurses is also similar to that of other professions in that the unique knowledge and skills demanded by both professions are sufficiently esoteric that education and experience can be gained only under the direction of someone who is already an expert (Ozar et al., 2018).

There seemed to be a palpable sense of resignation when discussions of these shortcomings emerged. For example, I would often hear stories or witness firsthand situations in which physicians purposely intimidated nurses during the course of communicating clinical information. Sometimes there would be yelling, berating in front of patients and families, pointing of fingers, tossing of objects, sarcastic responses to questions, hanging up the phone, and, well, the list goes on (Rosenstein and O'Daniel, 2008). The fear and trepidation this type of communication created in the hearts of those experiencing them were not limited to nurses. Medical interns and residents also endured similar experiences from attending physicians and/or those a step above them in the pecking order.

I knew this type of behavior existed. I experienced it myself while practicing years earlier, but now it seemed unimaginable to me, and I could not accept it. I would fervently discuss, with anyone who would listen, the simple fact that these communication patterns drastically undermine patient safety and should not be tolerated in any setting where high-risk work is carried out. I would go on to describe how in the cockpit such behavior would be considered deviant, not commonplace, and was trained out of the culture long ago. Although many peers agreed, all too often they would slowly shake their heads back and forth as if to say, "I hear you, and I concur, but that's just the way it is."

How can this be? How can a culture with so much at stake function successfully when people—who are supposed to be on the same team, working toward the same goals—cannot talk to each other? How can a culture proclaim that it is safe when some professional groups within it are afraid to speak up if they see a problem or have a question? Communication is not the only cultural challenge that strikes me this way. There are many others, and collectively they are deeply problematic.

This is in no way an indictment of the healthcare industry. On the contrary, it is simply an acknowledgment of the disconnect experienced after honestly assessing the systems and culture at work in many healthcare facilities when compared to a high-reliability industry such as the airlines—and that is the key here. Clinicians are perceptive and smart. I was not pointing out anything they had not already endured or seen. The difference, however, was that I had spent years in a safety-sensitive industry and seen it done in a different way, with excellent results. There are many similarities among physicians, nurses, and pilots. They are responsible for the safety of other human beings, and they operate in situations where mistakes can mean the difference between successful outcomes or loss of life. Culturally, however, there are significant differences.

In my mind, I envisioned a blank page with a thick black line down the center. On one side was the airline culture, and on the other side, healthcare. As I filled in the description of the cultures on each side of that line, stark contrasts emerged. Let us compare the two cultures.

Aviation Side of the Line

Team

At the airlines, there is a heavy emphasis on team training and team-building behaviors in the cockpit and beyond. This is the very essence of crew resource management (CRM), a program that has at its core the essential skills required to promote teamwork and effective communication (see Chapter 2 for a detailed explanation of CRM).

Teamwork and team-oriented behaviors are not only discussed in the classroom, but they are also reinforced and applied during flight simulation training sessions. Each member of the crew has specific responsibilities for keeping the team intact and functioning so that important flight

information is communicated in a timely and effective manner. It is understood that while leaders ultimately make operational decisions, all members of the team must participate and play an active role in the decision-making process. This is not only encouraged, but also expected. As leaders, airline captains fully assume the fundamental responsibility of building and maintaining the team. In large part, their effectiveness as leaders determines the effectiveness of the crew as a whole. To that end, captains learn and implement specific behaviors to ensure their team is engaged and speaking up when necessary (see chapters 3 and 4 for a detailed discussion of leadership and team-building behaviors).

CRM training also emphasizes the other side of the team equation, focusing on the crucial roles and responsibilities of those who support the captain. Subordinate crew members learn to use tools that allow them to communicate information effectively and assert their concerns to gain clear resolution when safety is in question. In the cockpit, followers are equally responsible for team outcomes (see Chapter 6 for a complete discussion of effective followership).

From the date of hire at an airline and through initial training, new pilot hires are paired and train together as a crew. As they move through the various phases of simulator training, the crew understands that while each member is being evaluated individually, their ability to successfully complete training depends in large part on how well they work together as a team. Pilots carry this with them beyond the training environment. They know full well that a strong sense of team, coupled with open communication, is their most effective tool in managing error and avoiding mishaps. As we discuss in Chapter 3, the definition of the airline team is not confined to the cockpit but includes many other players, such as flight attendants and maintenance personnel. The key point is that the team umbrella is large enough to ensure that the observations and contributions of those outside the cockpit are not ignored.

Human factors

Another important focal point in the airline culture is an awareness of human factors and the limitations of human performance (also included in CRM training). This is generally discussed within the context of situational awareness (see Chapter 7 for a full discussion of situational awareness). Specifically, pilots are taught to be acutely aware of fatigue and its effect on crew performance and decision-making. There is regulatory protection in

place, which mandates how long a pilot can be at the controls in a single day, how long a pilot can be available and on duty, and how much rest must occur between duty periods. Although these protections are not fool-proof, these Federal Aviation Administration-mandated protections do exist and are strictly followed. Pilots at most airlines have the option to "call in" fatigued without penalty if they feel that they cannot fly safely. While this option should be used judiciously, it is an available safeguard and can identify systems issues that may create patterns of fatigue among flight crews.

Sidebar 1.2

Preserving a group's culture

Of the numerous (and arguably equally valid) operating theories and definitions of culture, nearly all share one common aspect: the idea that certain things in social groups are shared or held in common (Sine and Northcutt, 2009). Behaviors by group members reinforce these values and members tend to behave in ways that teach these practices to new members, rewarding those who fit in and sanctioning those who do not. In this manner, the group behavior persists and the values are preserved over time even when group membership changes (Kotter, 2012). For new group members, the central-most values of an organization are at first as opaque and mysterious as they are to any outsider. For the newcomer, the threat of punishment for irregular behavior is possibly a more significant motivator than any vague perception of a potential reward that awaits attainment of "insider" status granted though a shared taxonomy and knowledge of the organization's symbols, rituals, and stories (Kramer and Tyler, 1996).

Incorporated into general operating manuals are information on restrictions surrounding the use of alcohol, strategies to optimize the use of caffeine, and how the ingestion of these substances can affect the ability to obtain restful sleep. The effect of life stressors on performance is openly discussed in the culture. Pilots are encouraged to monitor themselves and each other for the negative effects caused by stress. It is not uncommon for one pilot to ask another who is struggling with a divorce or death of a loved one, "Are you OK to fly today?" The key point is that there is a heightened awareness and active monitoring in the culture for the deleterious effects of stress on performance and operational safety. If it is best for a crew member to be temporarily relieved of flight duties, then that action is within the realm of possibility.

Pilots internalize paradigms and learn procedures that facilitate the safe use of technology as their cockpits become increasingly automated. In addition, there is an unequivocal recognition of the negative effects of distractions on cognitive processes. In the airline cockpit, there are rules and procedures that serve to reduce distractions and the effects of extraneous interruptions during critical flight regimes (see Chapter 7 for a complete discussion of the "sterile cockpit" rule). Critical flight regimes are those phases of flight that are task loaded, where vigilance and attention to detail are required to ensure safety. An example of such a regime is when an aircraft is taxiing. While operating on the ground, pilots must maintain awareness of their position relative to other aircraft and active runways, listen and respond to instructions from air traffic control, and complete checklists to ready the aircraft for takeoff. Pilots know well the consequences of losing focus during such times and are expected to remain disciplined and focused throughout.

Sidebar 1.3

A whole-systems approach to human factors

Human factors have come to mean almost exclusively the human machine interface. However, in this book, the term "human factors" refers to the processes and factors that influence the behavior of people (Durso and Nickerson, 1999). The full scope of human factors research may involve the human-to-human or human-to-environment interface in any work environment and include the disciplines of cognitive and perceptual psychology, engineering, architecture, industrial design, statistics, operations research, and anthropometry. No matter what interface is of interest, the goal of human factors inquiry is to understand and minimize incompatibility between people and the things we create and use (Casey, 1998; Bogner, 1994).

Human factor awareness is something that emerges at the earliest moments of a pilot's training. For example, when fledgling aviators are first learning to fly an aircraft without visual reference to the natural horizon (called *flying by the instruments,* or *flying in instrument meteorological conditions*) they must be disciplined enough to ignore the feelings and sensations that their bodies give them and force themselves to rely only on the instruments in front of them. In other words, maintaining aircraft control without the ability to see outside the cockpit requires that pilots respond to what they see inside, not what they feel. Many times the conflicting information between the inner ear and optic nerve can cause overwhelming disorientation. If not managed appropriately, pilots may actually apply pressure on

the controls incorrectly without realizing it, placing the aircraft in a dangerous descending spiral. Recall the well-publicized accident of John F. Kennedy Jr., an inexperienced pilot who lost control of his aircraft and plummeted into Nantucket Sound in low visibility. This point underscores the awareness that pilots must possess, almost from the beginning, about the dangers of mismanaging human limitations.

Standardization

Standardization is a staple in the airline industry. There are countless acronyms in the airline vernacular that include the letter "S" and that represent the word *standard*. Standardized procedures, maneuvers, and actions are ingrained in the culture. In fact, as a pilot, it is the most egregious insult if someone describes you professionally as "nonstandard."

If I were to ask you what is good about standardization or what standardization achieves for us as professionals, what would you say? Clearly one answer is that standardization essentially tells us what to do. It ensures that everyone is completing a task or procedure in the same manner. It puts everyone on the same page, reduces variability, and is a critical element in the airline culture. For example, a pilot might fly with 15 different people in a given month. Being standardized means that any two pilots can work together seamlessly in the cockpit and know exactly what to expect from each other regardless of who they are, what their personality types are, or what side of the bed they got up on that morning. It is understood that checklists will be read and responded to in the same way, the aircraft will be configured for takeoff and landing in the same way, and crew callouts and briefings

Sidebar 1.4

Patient safety and fatigue

Patient safety studies have shown that hospital nurses have significantly decreased levels of alertness and an increased likelihood for errors and close calls when working extended shifts (Rogers et al., 2004; Scott et al., 2006). The detrimental effects of fatigue also include negative effects on personal health, job performance, and professionalism. Long and often unpredictable hours to cover staffing vacancies, minimal recuperation time, and often unrealistic workloads appear to be a contributing factor in nurse absenteeism and job dissatisfaction (Owens, 2007; Aiken et al., 2002). One study found that job dissatisfaction among hospital nurses was four times greater than the average for all workers in the United States (Aiken et al., 2002).

will occur at the same time every time. Who makes up the crew does not affect standard operating procedures (SOP). There can be variations in pilot technique and personalities, for sure, but operations are spelled out, everyone is on the same page, and compliance with SOPs is a way of life.

Standardization also allows us to readily predict behavior. This means that if a crew member does not say or do what they are supposed to, when they are supposed to, it needs to be investigated immediately. Perhaps this individual is incapacitated, ill, or fatigued and experiencing low situational awareness. In the cockpit, when someone fails to carry out routine actions as expected, it gets the team's attention.

Some might say that standardization is a bad thing, that it stifles the ability to provide care in a manner that considers each patient as an individual, or that what is good for one is not good for all. I appreciate this concern and would respond in the following way: First, standards are evidence-based, not arbitrary; it is not wise to practice outside guidelines and protocols derived from data that are results driven. Second, standardization does not preclude considering each patient's individual differences in the implementation of care. For example, a standard may mandate that a nurse conduct preoperative teaching, but how the information is delivered depends solely on the patient's individual method of learning. The standard, preoperative teaching is clearly good for all; the method of delivery is not and therefore is expected to be individualized. Last, standardization also allows for variations in clinician technique when delivering care. Think about the many variations in technique for giving an injection or starting an intravenous (IV) line; however, with all of these variations, aseptic standards are still met.

Recurrent training and performance checking through simulation

When pilots are first hired, they go through initial training, part of which is called *indoctrination*. Here is where pilots learn the general operating rules and guidelines of the airline. They are instructed on what to do in the case of hijacking, minimum distances to stay clear of thunderstorms, how to handle a sick passenger or bomb threat, proper dress codes, and how much crew rest is required before attempting to fly. Another segment of the initial training is where the pilot learns the systems and cockpit procedures for the particular airplane they are going to fly. This usually includes a combination of classroom

and procedure training, which uses static and full motion simulation. The simulator is an exact replica of the cockpit and provides a level of reality that is nothing short of stunning. When pilots emerge from this training, they are ready to go to the line and fly the aircraft with passengers on board. This is where additional training, called *initial operating experience* (IOE), takes place under the watchful eye of a check airman (just like a preceptor in nursing or chief resident in medicine). When IOE is complete, pilots are released from training and become available to crew scheduling for flying assignments.

In the training described, there are points to evaluate a pilot's knowledge and performance. Knowledge testing takes the form of computerized testing and/or oral evaluations. Performance testing takes the form of what is called a *check ride*. Here, pilots fly the simulator and must demonstrate proficiency and execution of specified aircraft maneuvers within certain tolerances. They also must demonstrate the appropriate management of aircraft emergencies, such as an engine failure or rapid depressurization at altitude. The crew are also evaluated on their performance as a team, as they work together to problem-solve abnormalities.

The check ride is about performance under observation, and pilots understand this. Most learn early on in their careers to find ways to manage the natural anxiety that accompanies such an event.

As time goes by, pilots become lulled by the normalcy of operations. Aircraft systems and procedures begin to get a bit hazy and difficult to recall. For this reason, the airline industry practices recurrent training, practice, and performance checking. This means at specified intervals (these may vary; see Chapter 9 for a detailed explanation), pilots go back to the classroom and/or computer to revisit the salient policies and procedures of the airline. They may review important safety topics and lessons learned from industry accidents or mishaps. They review aircraft systems and operating limitations, along with any significant changes to airline procedures. They also complete a recurrent check ride in the simulator as previously described. Recurrent training and performance checking is one method the airline culture uses to manage the natural tendency for human beings to become complacent over time. Pilots emerge from recurrent training with revitalized knowledge and confidence, which creates margins of safety in the operational environment.

Checklists

Pilots live and die by checklists—literally. Aviation history has its share of mishaps that can be traced back to poor or absent checklist utilization. This is the rare exception, not the rule. I mentioned earlier that standardization is a staple in the airline industry; the same can be said for checklists. Pilots discipline themselves to adhere to checklists consistently and without question. This does not imply that checklists are used without judgment, but it does mean they are consulted at specific points during all phases of flight to support memory and situational awareness (Weaver et al., 2019). It is not unreasonable to say that checklists are the backbone of the airline safety culture.

Checklists are used differently depending on the situation. For example, the manner in which a pilot uses a checklist in an emergency varies significantly from how it will be used for routine scenarios. In fact, the checklists themselves look different in terms of presentation and structure. Differences in checklist philosophy and presentation ensure ease of use and optimal support of human memory. If you are a physician or nurse, think back to a time that you used a checklist in practice. Was it easy to use? Did it make sense? Did it make your job easier or create more work for you?

Checklists have been developed and utilized in healthcare, demonstrating measurable and positive effects on patient safety. It is imperative, however, for continued utility in the clinical environment that checklists are created using the appropriate philosophy, matching the checklist's format to the task at hand. An extensive discussion about creating checklists in clinical practice can be found in Chapter 8.

This concludes the overview of the airline culture, and it's time to move on to the healthcare domain. Before we do, I feel the need to quote that famous robot from the TV show *Lost in Space:* "Warning, Warning, Danger, Will Robinson!" There is unpleasant reading ahead. As stated earlier, the aim of this chapter is to provide a quick culture comparison based on my vantage point moving from the flight deck to the operational culture that permeates the delivery of clinical care. Keep in mind that while we may identify cultural deficiencies, the book is not about decrying problems, but using CRM to solve them.

Healthcare Side of the Line

Hierarchy

Right away, it was apparent upon reentry into healthcare that there were cultural roadblocks to effective communication. Most salient is the hierarchical nature of relationships among certain members of the patient care team, whether it be in the operating room, emergency department, clinic, or inpatient nursing unit. A particular area of concern was the presence of intense authority gradients existing within the nurse-physician dyad. History demonstrates that, in general, healthcare relationships have been characterized not by open communication and team orientation, but rather by an emphasis on centralized power in decision-making (Federal Aviation Administration (FAA), 2010). For nurses, this is all too apparent as they often experience adversarial responses, poor behavior, and unpredictable and capricious reactions from medical decision-makers while attempting to manage and communicate patient problems. Intense authority gradients also exist within physicians, making it difficult for trainees and less tenured physicians to speak up or push back with superiors when concerns or differences of opinion as to the best course of action exist. One meta-analysis found that intimidation, harassment, and discrimination (IHD) were highly prevalent among resident physicians in most specialties, with pooled prevalence estimates for some form of IHD in residency training to be at 67% (Bahjii and Altomare, 2020). Hierarchy is necessary for organizations and teams to function; someone must possess the authority to serve as the ultimate decision-maker. But the undesirable byproducts of hierarchy must be acknowledged and actively mitigated by team leaders. Overly dictatorial leadership styles reduce the possibility that team members will speak up in the moment when safety is compromised. This has been shown to be the case in the operating room setting, for example, even when subordinate team members observe a clear deviation from protocol (Barzallo et al., 2014). A few years ago I was presenting to a group of medical residents on the use of a communication tool for graded assertiveness—meaning that the tool provided algorithmic steps to respectfully escalate concerns if attending physicians were not listening. What struck me about this group was the unanimity in their depiction of the trepidation felt when having to communicate with certain attendings. It was clear that this was not a one-off, but a consistent and pervasive problem. There was a hunger in this group for any tool or method that could help them communicate in the face of great trepidation.

Missed meals

By far, nurses spend the most time with hospitalized patients. If there are subtle changes in a patient's condition, it will be a nurse who detects it. For this reason, it's a logical choice to focus on nurses when talking about the notable significance of missed meals. In a way, it seems paradoxical that nurses who spend incredible amounts of time in school learning about the physiology of the human body can live in a culture that quietly avoids serious discussions regarding how human limitations affect clinical performance. Let's start with the two most overused letters in the nursing profession: N and L. Put together, they read "NL," which stands for "No Lunch." Nurses often complain that they cannot get lunch because they are so busy. Many times, this is absolutely true and regrettable. The culture has responded to this problem by offering compensation when meals are missed. Rather than fix the core issue, we allow nursing staff to write "NL" in a pay exception log; nurses may not eat, but they will get paid. For some nurses, this insidiously becomes a part of their financial planning as they realize the boost that these two initials can give their paycheck. The human body needs fuel to maintain acceptable blood glucose levels and to nourish organs and tissues properly, most importantly the brain. Yet in professional nursing today, we expect practitioners to make accurate clinical decisions under great pressures while at the same time going long hours without a proper meal, enjoyed without interruption.

Fatigue

The research on the negative effects of fatigue on motor and cognitive performance is well documented. As discussed, there is regulatory protection in aviation that sets a standard for pilot duty time and rest requirements. I will assert that as an industry, healthcare has not gotten serious about fatigue management, and the protections in place remain paltry. For example, in 2003 the Accreditation Council for Graduate Medical Education enacted duty hour restrictions for residents (physicians in training) that limited the work week to 80 hours and the length of any one shift to 30 consecutive hours. To say that this was long overdue is stating the obvious. In 2011, these restrictions were further refined to limit the shift length to 16 consecutive hours for first-year residents and 24 hours for intermediate residents. The resistance to these changes argued that reducing shift lengths would induce error by creating the need for more human-to-human handoffs while reducing the cumulative clinical experience of residents, leaving them ill prepared to manage complex clinical problems later on. Studies have not validated these

concerns (Weaver et al., 2020). My question is, why are we arguing about the appropriateness of a 16-hour continuous duty period and an 80-hour work week? I appreciate that these restrictions are improvements from the abysmal situation that existed prior to 2003, but when you consider the fact that error rates rise sharply when shift length exceeds 12 hours, and cognitive function wanes drastically as "time awake" approaches 14 hours, it's hard to see these limits as safe and humanistic (FAA, 2010).

In nursing, fatigue protections are not uniformly present, leaving fatigue and rest guidelines up to individual healthcare organizations. These guidelines can be liberal and are often pushed to the limit or creatively ignored to relieve staffing pressures.

Nursing shift patterns tell the story with multiple 12-hour shifts scheduled in a row. The problem here is that multiple 12-hour shifts can lead to chronic fatigue and sleep debt if restful sleep is not obtained between duty periods. During a day in which nurses complete 12-hour shifts, they may actually be awake for as much as 17 hours, assuming they get up at 5 a.m. and go to bed by 10 p.m. Even in the best scenario, in which restful sleep is obtained for the seven full hours remaining before it is time to get up and do it all over again, this routine can be cumulatively exhausting. It is difficult to believe that at 5 p.m. on the third 12-hour day shift in a row, nurses can safely handle the enormous workload and cognitive challenges existing on today's multibed inpatient units.

Known work factors arguing against the use of 12-hour shifts include:

- Heavy physical work
- Demanding, repetitive mental work
- Safety-sensitive work
- Work requiring vigilance (Rogers et al., 2007)

If this is not the quintessential description of nursing, then I don't know what is. If you understand the nursing culture, you know that 12-hour shifts are embraced by many within it. Twelve-hour shifts provide the opportunity to achieve concentrated work schedules and additional time off within the work week. For a workforce that consists of a large proportion of working mothers and many single working mothers bearing the dual responsibility of

breadwinner and parent, this scheduling option can be attractive. When you add to this the existence of double shifts (16 hours), which sometimes occur back to back, double backs (working until 11 p.m. and returning at 6:45 a.m. the next day), excessive amounts of available overtime, and nurse managers desperate to fill staffing holes day to day, the conditions for the perfect storm to create a fatigued workforce are in place.

Task load

Pilots must multitask. There can be times in the cockpit when things get dicey and task load gets to a saturation point. Undoubtedly, pilots in this situation will miss something or not respond appropriately as the number of stimuli exceeds the brain's capacity to process. It is, of course, advantageous to have another crew member backing you up so that safety-critical items are not overlooked. In the nursing domain, task saturation occurs all too frequently, which is a great source of error and frustration.

For example, a typical medical-surgical nurse may have the following occur on the average day within a 30- to 60-minute period:

- A physician at the nurses' station wants to talk about a patient's vital signs
- A patient requests IV pain medication
- The nurse begins administering routine morning medications to all seven of their patients
- A patient is awaiting discharge teaching
- A new admission has just arrived on the floor and needs to be clinically assessed and processed
- An IV infusion pump alarm is sounding
- A patient calls to complain that an IV is leaking at the insertion site
- A patient needs to be sent to surgery
- The blood bank calls and says that the first unit of packed red blood cells (PRBC) to be transfused for a patient is ready for pickup
- The case manager hands the nurse a nursing home transfer form and wants them to fill in the patient's medications and latest vital signs

Clearly, this is a lot to manage in such a short time. I can see many nurses reading this, nodding their heads, and saying, "Yep, that sounds like a routine day for me." The existing professional culture allows the placement of nurses in situations where the requirement to multitask reaches unmanageable levels and at the same time demands precision and success. How can we realistically talk about patient safety when task saturation is the order of the day? Unlike pilots in the cockpit, when nurses endure task saturation, there is often no one to back them up to make sure critical things are not overlooked.

Physicians don't fare much better. I remember talking with a hospitalist several years ago who was traversing an inpatient unit in a metropolitan hospital. It was late in the day—he seemed weary and tired from going in and out of patient rooms, taking the time to document methodically between patient visits. Our brief discussion quickly centered on workload. As part of his rounding, he visited several facilities in the local area each day, some days seeing as many as 90 patients. It was clear that his frustration centered on how the volume of activity made it difficult to provide quality care; he was in my view approaching a condition akin to helplessness, mental exhaustion, and burnout. While this may be an extreme case, high task load and burnout continues to be a problem for physicians across many specialties and practice settings. One study queried more than 500 hospitalists regarding their perceptions about actual workload versus perceived safe workload. Forty percent of the physician respondents reported exceeding what

Sidebar 1.5

The myth of multitasking

The shorthand used for the human attempt to simultaneously do as many things as possible, as quickly as possible, preferably marshaling the power of as many technologies as possible, is multitasking (Rosen, 2008). Although we may consider ourselves experts in crowding, pressing, packing, and overlapping distinct activities into all-too-finite moments, according to researcher James Poldrack, "We're really built to focus. And when we sort of force ourselves to multitask, we're driving ourselves to perhaps be less efficient in the long run even though it sometimes feels like we're being more efficient" (Gleick, 1999; NPR, 2007). In addition, we can easily become so preoccupied with one task that monitoring of all other tasks is stopped. Even if monitoring does not drop out completely, the quality of monitoring suffers. Although the study of the cognitive processes involved when juggling several tasks concurrently is just beginning, it is known that multitasking is error prone (Loukopoulos et al., 2009).

they identified as safe workloads, with 36% stating that this occurred more than once per week. Hospitalists identified high task loads as a significant factor in their inability to communicate fully with patients and hindered their ability to admit and discharge patients in a timely fashion. Twenty percent of respondents linked average workloads to patient morbidity and mortality (Michtalik et al., 2013).

Cognitive task load takes a toll on providers, contributing to burnout. One study examined the relationship between task load and burnout, measured by the National Aeronautics and Space Administration (NASA) Task Load Index. This specific scale measures physical, temporal, and mental demand; the scale also measures effort, frustration, and performance. Both the Depersonalization and Emotional Exhaustion scales of the Maslach Burnout Inventory were utilized to assess burnout. Of note, for every 40-point (10%) decrease in physician task load, there were 33% lower odds of experiencing burnout (Harry et al., 2021). Issues that increase task load include workplace inefficiency, excessive workload, and—importantly—"negative leadership behaviors" (West et al., 2020).

Nonclinical functions

Imagine if leadership at an airline said the following to its pilots: "Look, guys, today we are short a flight attendant. What we need you to do is, after you level off at 35,000 feet, unbuckle your safety harness, walk to the back, and help serve peanuts and beverages." It is absurd to even consider such a request. Passengers would start squirming in their seats if such a thing actually happened. They would think, "Aren't they supposed to be flying the airplane?" We would never expect pilots to sacrifice concentration for the completion of tasks outside the scope of their primary job, which is to fly the airplane. In healthcare, this line is not so distinct. A major difference between aviation and healthcare is that pilots, while in operational mode, cannot delegate their functions to nonflight crew members, yet in healthcare, nonclinical and quasi-clinical administrative functions can be meted out to frontline providers (Smith et al., 2018). This is reasonable; however, when adjunct work becomes a detriment to the actual "work" of patient care or additional tasks fall well outside the realm of clinical practice, serious risks for patient harm emerge.

For nurses, their number one job is to assess patients using specialized knowledge and critical thinking to detect and manage clinical problems. Yet all too often, nursing as a

discipline seems to be a repository for tasks left unclaimed, unassigned, or undone. When the patient transport department is short of personnel, the pharmacy does not have enough technicians to run medications to the unit, or housekeeping is running behind, nurses are often expected and required to take on these tasks. Healthcare systems may roll out new initiatives that require the completion of additional work or steps to document compliance with policy or accrediting bodies. While other disciplines might balk at such impositions, this work is often imposed upon nursing staff. While doing what needs to be done in the moment to promote quality and safety is reasonable, the widespread and wholesale expectation to complete nonnursing functions facilitates task saturation, interrupts nursing thought work, promotes fatigue, and places patients at risk.

The electronic health record (EHR), obviously a great innovation that continues to evolve and improve, has presented an array of daunting challenges. In multiple instances, the EHR inadvertently emerged as a major impediment that detracted from patient care. Documentation has always been a necessary and challenging element for all clinical providers. The issue at hand is that the EHR is failing to streamline the act of documentation, in essence adding complexity and reducing the thought space for providers to assess, diagnose, and problem-solve. One study, which assessed work allocation among 57 physicians, disclosed a remarkable disparity between time spent on the EHR and spent with the patient. Approximately twice the provider time was spent on EHR documentation than was spent with the patient (specifically, 49.2% on the EHR and 27% with the patient). A study of 6,375 physicians in active practice across the United States indicated that the administrative burden of the EHR contributed to a higher risk of burnout (Senturk and Melnitchouk, 2019; Shanafelt et al., 2016; Sinsky et al., 2016).

Distractions

Earlier we discussed the term *critical flight regime* to describe periods in the cockpit where task load is high and distractions and/or interruptions pose a serious threat to safety. What would be considered a "critical flight regime" in healthcare? What task or area of work above all others is the most risk sensitive, carrying the potential for catastrophe if steps are omitted or mishandled? While there are many, one that quickly comes to mind is medication delivery. The process of medication prescribing, preparation, dispensing, and administration is replete with opportunities for failure. Many disciplines are involved, and multiple steps and handoffs

occur as humans interface with computer functions, displays, and automated dispensing systems. One analysis of the United States Pharmacopeia's MEDMARX reporting system looked at a subset of medication error reports totaling just more than 38,000 where contributing factors—information about the environment or situational influences—were provided by the reporter. Of the more than 50,000 contributing factors identified, interruptions and distractions accounted for almost half (49%) (Santell et al., 2003). It's a telling statistic about the environment in which this high-risk work is carried out in healthcare. This leads us naturally to focus on the nursing domain, where nursing staff not only interface the most with hospitalized patients out of all professional groups but may spend up to 40% of their clinical time delivering medications. One study, which included 79 medical-surgical nurses across nine hospitals, analyzed just over 850 medication administration episodes that were observed by trained personnel. Interruptions occurred in 67.1% of administration episodes with at least one distraction occurring in 76.1% of administration episodes. What's interesting about this study is the type and frequency of the distractions observed. The top four were unresolved issues with other patients (49%), fatigue (36%), hunger (36%), and ambient noise levels (31%). Each of these distractions speaks to the very essence of the human factor and human-centered design issues that have beleaguered clinical work units for decades and are completely manageable given time and effort (Saxton and Cahill, 2017).

There are bright spots in healthcare. The discipline of anesthesia delivery has been well ahead in the industry. In fact, when you think about the measurement threshold of high reliability, one catastrophic event per million (10^{-6}) (Amalberti et al., 2005), anesthesia has actually achieved this level of performance, primarily because it was the first medical specialty that emphasized and championed patient safety as a primary objective. Noteworthy was an assembly of experts sponsored by the Anesthesia Patient Safety Foundation (APSF), an organization established in 1985. The conference, entitled "Distractions in the Anesthesia Work Environment: Impact on Patient Safety," convened in 2016 (van Pelt and Weinger, 2017). Representatives in attendance included surgeons, anesthesia professionals, and operating room and perioperative nurses. Also in attendance were representatives of both the nuclear power and surface transportation industries. Objectives included identifying distractions that were high risk and developing recommendations to reduce and mitigate distraction risk. Numerous types of distractions were identified: Technological distractions contributed to approximately 40% of nonroutine events—specifically, when the technology failed or was unavailable. The time-consuming demands for

"low-value" intraoperative data entry were also a source of distraction, as were ambient noise and alarms associated with physiologic monitoring. Self-induced distractions were acknowledged, such as the intraoperative presence of personal electronic devices (i.e., cell phones), which compromise anesthesia vigilance. Interpersonal dynamic breakdowns were identified as a major contributor to distractions such as individual disruptive behavior and teamwork failures (we will discuss and address this issue in later chapters). The fact that anesthesia as a discipline openly acknowledges these human factor challenges is critical to ameliorating them. Anesthesia has also embraced the development of standard operating procedures, checklists for use in crisis situations, and the use of simulation for competency training (Gaba et al., 1991; Gaba, 2004; Gaba et al., 2015). These actions are admirable and reflect the essence of high reliability, but this is discipline-specific—not industrywide.

Sidebar 1.6

Task interruptions and inadvertent omissions

In *The Principles of Psychiatry,* William James has praised "the faculty of voluntarily bringing back a wandering attention, over and over again" as the very root of judgment, character, and will. However, in the high-stakes environment of the nursing unit, interruptions, distractions, and unexpected task demands, which impair both individual and team performance, are the norm (Pape, 2003). Interruptions challenge the cognitive mechanism by which individuals remember to perform intended actions and remember to execute a deferred task. Without an explicit prompt that the time has come to act, it is all too easy to forget. Thus, inadvertent omissions have been shown to constitute the largest class of human performance problems in numerous hazardous operations (Reason, 2002).

Standardization

We talked briefly about standardization in the airline culture. In the cockpit, standardization provides a frame of reference, frees up cognitive space, serves to mitigate the unexpected, and allows us to predict behavior in both routine and emergent circumstances. For clinicians, it serves the same purpose; however, the clinical environment serves up a unique problem when it comes to standardization. In one sense, it is difficult to reduce variation in healthcare when there are many different patient populations and disease specialties. Certainly, accepted practices (e.g., delivering an injection) differ greatly for an adult versus a neonate. Sex differences, ethnicities, and age may require great variation in the manner that any one disease is managed.

But putting these considerations aside, healthcare as an industry needs to do better in reducing variation where possible. The nursing culture has traditionally been programmed to accommodate varying preferences and idiosyncrasies of physician providers. For example, there are facility-based protocols regarding heparin, sliding-scale insulin, and postoperative analgesia, yet some physicians choose to use variations of these protocols based on individual preference. In such cases, nurses are burdened with having to keep tabs on an array of preferences rather than a single standard. This is not optimal from an error avoidance standpoint.

Equipment may differ as well. Defibrillators and hospital beds can vary from unit to unit within the same facility. Vendors can change, causing unanticipated changes in syringes and drug packaging. Variation in surgical instrument sets and operating room equipment can set teams up for errors (Avansino et al, 2016).

Differences in patient care processes among units can also be commonplace. While some units may be standardized in their processes, their "standards" are not uniform throughout a facility. The result is pockets of differing standardization, creating vulnerabilities across the larger system. As clinicians of any discipline move throughout the system, the variation they encounter sets them up for error.

The case below illustrates this point:

On 9 North, a medical-surgical unit, the computer-generated medication administration record (MAR) schedules a.m. insulin to be given at 0700, which appears in the day shift section of the MAR. Although the day shift technically begins at 0700, day shift nurses are in report and not available to administer insulin. On 9 North, breakfast trays usually arrive right at 0700 as well. Because of this, the unit has decided that the night nurse will administer the insulin prior to 0700 and document on the night shift section of the record.

9 East is also a medical-surgical unit. On this unit, the day nurse administers all 0700 insulin, and it has been done this way for years. One night, a nurse from 9 North is floated to 9 East to help with short staffing. Prior to 0700, the nurse administers the 0700 insulin as she does on her home unit. This is business as usual to her, so she makes no mention of this routine activity when she reports to the day shift nurse. The day shift nurse on 9 East does not see the night shift documentation of the insulin that was given to the patient (there

would be no reason for her to check this) and administers the a.m. insulin to the patient for the second time, documenting this act in the 0700 block of the MAR. A few hours later, the patient becomes severely hypoglycemic.

It is important to recognize that much has been done with regard to industrywide standardization in recent years. Uniform care bundles for sepsis, the push for standardized handoff tools, and universal protocol in surgery are great examples; however, healthcare leaders must ensure that these tools are applied uniformly, and that unnecessary variation is eliminated at an enterprise level (Karamchandani et al., 2018; Sculli et al., 2019).

Recurrent training and performance checking

When speaking to healthcare audiences, I usually ask three questions with regard to training:

Question 1: Who has practiced in a healthcare facility or organization for more than 10 years? (Several hands go up.)

Question 2: For those who raised their hand, did you attend new employee orientation when you were hired 10 years ago? (The same number of hands goes up.)

Question 3: For those who raised their hand, how many have gone back through orientation within those 10 years? (Not a single hand goes up.)

It is conceivable that after initial new hire orientation is complete, frontline staff will never again return to the classroom setting for a review of basic policies and procedures. Again, let's look at nursing staff. Nurses might complete yearly competency or skills checkoffs, but these are often more of a formality and can be haphazard. Often nurses must complete such checkoffs on their own time (above and beyond their work schedule) or are expected to squeeze the review into their workday while they are on the unit caring for patients. Usually, this means they will run down to the skills area and move rapidly through multiple stations, completing the yearly requirement in minimum time. Stations are designed for ease of flow rather than detailed practice and challenge. It is not a test of knowledge, but rather the fulfillment of a requirement: a checkoff. Completely removing nurses from their clinical duties and sending them to a comfortable learning environment

for training and practice, and then thoroughly checking performance using high-fidelity simulation is not common practice in the culture. I'm not talking about advanced cardiac life support training and certification. Rather, I am speaking about an organization ensuring that frontline clinical staff of all disciplines receive initial and repeat training at regular intervals (i.e., annually, occurring and recurring on a perpetual basis). The training would cover general policy and procedure applicable to all employees, as well as technical knowledge germane to one's discipline and clinical specialty. The training would also encompass nonclinical material such as the discipline of CRM while creating opportunities for various disciplines to practice together in teams. For example, a surgeon's recurrent training and checking syllabus would be as follows:

1) Attend general policy and procedure training with all employees.

2) Accomplish hands-on practice with common and uncommon surgical procedures to address the technical domain.

3) Practice a surgical event with the entire operative team via high-fidelity simulation.

4) Encounter a competency check with the entire team via a high-fidelity simulation.

Efforts to implement CRM in healthcare have achieved some success but have been isolated to specific healthcare systems and waned over time due to implementation barriers such as staff turnover, lack of resources, and lack of leadership commitment to the endeavor (Wolk et al., 2019; Brindle et al., 2018).

These barriers are anathema to high reliability. This topic will be outlined in detail in Chapter 9.

Conclusion

Now the blank page is filled and the culture comparison—aviation on one side and healthcare on the other—is complete. There is clearly work to do within the healthcare industry. Timeouts, briefings, and checklists are not new, yet we still see avoidable harm resulting from a lack of consistency, completeness, and/or commitment in their use. While organizational leaders can earnestly take large strides in attempting to create a just culture, improve reporting, and create a culture of safety, high reliability will never be within reach if there is not, at a minimum, equal dedication and resources afforded to training frontline staff in CRM—aka "Team Training" or, as I like to say, healthcare CRM. There is a well-discussed model for high reliability that talks about the three main pillars of an HRO being a safety culture, leader engagement, and continuous process improvement (Chassin and Loeb, 2013). I am not convinced and, in fact, offer a different model. The associated publication can be accessed with the following link: https://pubmed.ncbi.nlm.nih.gov/33044255/ (Sculli et al., 2020). If I were to extract pillars from this model, I would offer the following three pillars: leader engagement, just and fair culture, and healthcare CRM. These three pillars would surround a nucleus entitled *Culture of Safety*.

Now let's move forward and discuss the discipline of CRM and why it is critical to any healthcare organization's journey to high reliability.

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SOARING TO SUCCESS

The Path to Developing High-Reliability Clinical Teams

Gary L. Sculli, MSN, ATP
Keith Essen, RN, PhD, MSS

Written by a former airline pilot turned nurse and a patient safety expert, this practical resource offers solutions to managing longstanding challenges in patient care by applying the practices of crew resource management. This one-of-a-kind resource uses engaging case studies and real-life examples to provide a framework for improving communication and patient safety. This book will help you:

- Apply innovative solutions to medication administration, shift report, patient handoff challenges, and interdisciplinary communication
- Streamline patient care activities with crew resource management-based tools (e.g., checklists)
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